In the Claims

Please replace all prior versions, and listings, of claims in the application with the following list of claims:

1. (Original) A method for detecting the presence of a IgG4 polypeptide having a selected disulfide linkage pattern in a sample comprising, loading a sample containing a polypeptide having a selected disulfide linkage pattern, wherein the sample comprises an inhibitor of disulfide bond rearrangement, onto a chip comprising a channel having a separation medium effective to act as an obstacle to the migration of the polypeptide having a selected disulfide linkage pattern, and at least two electrodes disposed within the channel to induce an electric field, applying an electric field across the separation medium of the chip whereby a separation of the IgG4 polypeptide having a selected disulfide linkage pattern as compared to a IgG4 polypeptide not having the selected disulfide linkage pattern is achieved, and determining the presence of the IgG4 polypeptide having a selected disulfide linkage pattern.

2. (Original) A method for detecting the presence of a polypeptide having a selected disulfide linkage pattern in a sample consisting of a mixture of polypeptide multimers having two or more polypeptide chains and comprising at least one disulfide linkage between the polypeptide chains comprising, loading a sample containing the mixture of polypeptide multimers, wherein the sample comprises an inhibitor of disulfide bond rearrangement, onto a chip comprising a channel having a separation medium effective to act as an obstacle to the migration of the polypeptide having a selected disulfide linkage pattern, and at least two electrodes disposed within the channel to induce an electric field, applying an electric field across the separation medium of the chip whereby a separation of the polypeptide having a selected disulfide linkage pattern as compared to a polypeptide not having the selected disulfide linkage pattern is achieved, and determining the presence of the polypeptide having a selected disulfide linkage pattern.

3. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the inhibitor is a sulfhydryl alkylating reagent.

4. (Original) The method of claim 3, wherein the sulfhydryl alkylating reagent is selected from the group consisting of iodoacetamide and N-ethylmaleimide (NEM).

5. (Original) The method of claim 4, wherein the sulfhydryl alkylating reagent is N-ethylmaleimide (NEM).

6. (Original) The method of claim 5, wherein the amount of N-ethylmaleimide (NEM) is between about to about 10 mM.

7. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the method further comprises determining the presence of a polypeptide impurity.

8. (Original) The method of claim 1, wherein the IgG4 polypeptide having a selected disulfide linkage pattern is a half-antibody.

9. (Original) The method of claim 2, wherein the polypeptide having a selected disulfide linkage is a half-antibody.

10. (Original) The method of claim 9, wherein the half-antibody is of the IgG4 class.

11. (Original) The method of claim 1, wherein the IgG4 polypeptide having a selected disulfide linkage pattern is recombinantly produced.

12. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the polypeptide is recombinantly produced.

13. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the polypeptide having a selected disulfide linkage pattern is recombinantly produced.

14. (Original) The method of claim 1, wherein, the IgG4 polypeptide not having the selected disulfide linkage pattern is an anti-integrin antibody.

15. (Original) The method of claim 2, wherein the mixture comprises an anti-integrin antibody.

16. (Currently Amended) The method of claim 14 ~~or 15~~, wherein the anti-integrin antibody is recombinantly produced.

17. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the sample is obtained from the growth medium of a cell culture.

18. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the sample comprises about 1 to about 5000 ug/ml of a polypeptide having a selected disulfide linkage pattern.

19. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the separation medium is a gel polymer.

20. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the separation medium is non-reducing.

21. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the migration of the polypeptide is detected using a fluorescence detector.

22. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the electric field is non-alternating.

23. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the separation further comprises isoelectric focusing.

24. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the separation is according to the molecular weight of the polypeptide.

25. (Currently Amended) The method of claim 1 ~~or 2~~, wherein the chip comprises a precast gel polymer.

26. (Original) A kit for detecting the presence of a polypeptide having a selected disulfide linkage pattern comprising, a chip and instructions for carrying out the method of claim 1.

27. (Original) A kit for determining the purity of a therapeutic polypeptide having a selected disulfide linkage pattern comprising, a chip and instructions for carrying out the method of claim 1.

28. (Currently Amended) The kit of claim 26 ~~or 27~~, wherein the kit further comprises a component selected from the group consisting of, separation medium, non-reducing buffer, protein dye, formulation buffer, and means for inducing an electric field through a separation medium.

29. (Currently Amended) The kit of claim 26 ~~or 27~~, wherein the kit further comprises instructions for determining the presence of a polypeptide impurity.

30. (Currently Amended) The kit of claim 26 ~~or 27~~, wherein the kit further comprises one or more polypeptide standards.

31. (Original) A method of inhibiting disulfide bond rearrangement, wherein the polypeptide is incubated with a sulfhydryl alkylating agent selected from the group consisting of iodoacetamide and N-ethylmaleimide (NEM).

32. (Original) The method of claim 31 wherein the sulfhydryl alkylating reagent is N-ethylmaleimide (NEM).

33. (Original) The method of claim 32, wherein the concentration of N-ethylmaleimide (NEM) is between about 1 mM to about 10 mM.

34. (Original) The method of claim 31 wherein the disulfide bond rearrangement occurs upon exposure to heat.

35. (Original) A composition comprising a polypeptide and inhibitor of disulfide bond rearrangement, wherein the inhibitor is a sulfhydryl alkylating agent.

36. (Original) The composition of claim 35, wherein the sulfhydryl alkylating agent is selected from the group consisting of iodoacetamide and N-ethylmaleimide (NEM).

37. (Original) The composition of claim 36, wherein the sulfhydryl alkylating reagent is N-ethylmaleimide (NEM).

38. (Original) The composition of claim 37, wherein the concentration of N-ethylmaleimide is between about 1 to about 10 mM.

39. (Original) The composition of claim 35, wherein the polypeptide is a multimeric polypeptide.

40. (Original) The composition of claim 39, wherein multimeric polypeptide is an antibody or half-antibody.

41. (Original) The composition of claim 40, wherein the antibody is an IgG4 antibody.

42. (Original) The composition of claim 41, wherein the antibody is an anti-integrin antibody.